REMARKS/ARGUMENTS

Claim Status – Request for Reconsideration

Reconsideration of this application is requested. The claims presented for reconsideration are claims 59, 95, 102, and 103, as amended.

Claim 59 has been amended to further clarify that the second end of the feed introduction nozzle protrude into or be flush with an interior surface of the reactor unit to which the nozzle is attached. The basis for this amendment is found at paragraph [0027] of the specification. The claim has also been amended to emphasize that the second larger diameter cylindrical tube is oriented coaxially to the feed introduction nozzle to form an outer cooling pathway around the feedstock pathway so that the feedstock can be maintained at a temperature effective to minimize or eliminate the formation of metal catalyzed side reactions. This description of the cooling pathway is consistent with the written description of the invention at paragraph [0052] of the specification. Accordingly, no new matter has been entered by way of this amendment.

Claim Rejections – 35 U.S.C. § 102(b)

Claims 59, 104 and 105 were rejected under 35 U.S.C. § 102(b) as allegedly anticipated by U.S. Patent No. 4,282,010 to Cherish (hereinafter "Cherish"). This rejection is traversed and reconsideration requested, insofar as the rejection could pertain to amended claim 59. As claims 104-105 have been canceled, the rejection of those claims is rendered moot.

This invention is directed to a feed vaporization and introduction system for a methanol to olefins (MTO) reactor. The system is particularly advantageous with MTO reactors in that it reduces, inhibits, or eliminates the formation of metal catalyzed side reactions that occur when heated methanol comes into contact with metal surfaces. *See* paragraphs [0019]-[0021] of the instant specification for a more complete description of the problem that is solved by the claimed invention.

The claimed system includes an oxygenate inlet that has one or more heating devices for vaporizing feedstock. Also included in the system is an oxygenate feed introduction nozzle connected to the inlet. The nozzle can include a tubular member that has a first end for receiving a feedstock from the heating device, a second end protruding into or flush with an interior

surface of the reactor, and an inner nozzle surface forming a conduit for delivering the feedstock from the first end to the second end. At least a portion of the inner nozzle surface can be formed of a commercial alloy resistant to the formation of metal catalyzed side reaction byproducts. There is typically a second, larger diameter cylindrical tube oriented coaxially to the feed introduction nozzle that can form an outer cooling pathway around the tubular member, so that the feedstock can be maintained at a temperature effective to minimize or eliminate the formation of metal catalyzed side reactions. The cooling pathway can be closed-off at the first end of the nozzle, so that cooling medium can flow toward the reactor unit and can exit the feed introduction nozzle within the reactor unit through a diluent outlet.

Cherish discloses a coaxial feed system for fluidized bed coal gasification processes. The feed system has an inner tube for injecting particulate combustibles into a transport gas, an intermediate annulus about the inner tube for injecting an oxidizing gas, and an outer annulus about the intermediate annulus for transporting a fluidizing and cooling gas. The combustibles and oxidizing gas are discharged vertically upward directly into a combustion jet, and the fluidizing and cooling gas is discharged in a downward radial direction into the bed below the combustion jet.

Cherish differs from the claimed invention in that, *inter alia*, Cherish only discloses a nozzle apparatus and not a complete feed vaporization and introduction system as claimed by Applicants. Specifically, the Cherish apparatus does not include an oxygenate inlet that has one or more heating devices for vaporizing feedstock. While Applicants note the Examiner's points on pages 7-8 of the Office Action regarding the remoteness of the heating, Applicants respectfully note that this is not the entirety of Applicants' argument – Applicants respectfully point out that, although the "[c]har fines and coals" of Cherish may be heated when they reach the nozzle, Cherish does not disclose or suggest that the inlet itself comprises a heating device. Applicants respectfully submit that a heating unit connected by one or more lines to the inlet is not inherent, as the "[c]har fines and coals" of Cherish may be heated at a point remote even to the inlet, in which case one or more heating devices would be neither inherent nor even necessary in Cherish. Applicants respectfully submit that the Examiner cannot imply the presence of the heating device without it being inherent in all possible circumstances. And since

Applicants have pointed out a circumstance in which an inlet heater may be a detriment, and certain would not be required, Applicants respectfully submit that the Examiner's inherency argument cannot be maintained and that maintenance of an anticipation rejection in such a circumstance would be improper.

Additionally, the Cherish nozzle does not have a second, larger diameter cylindrical tube oriented coaxially to the feed introduction nozzle so that the second larger diameter cylindrical tube forms an outer cooling pathway around the tubular member such that the feedstock is maintained at a temperature effective to minimize or eliminate the formation of metal catalyzed side reactions, with the second tube also being arranged so that cooling medium flows toward the reactor unit and exits the feed introduction nozzle within the reactor unit through a diluent outlet. Although Cherish has a cooling tube, it is a third tube that is situated around an intermediate tube, in which the intermediate tube transports oxidizing fluid such as air. The air transport tube is the second tube, and it is located around the inner feed tube, which feeds char fines and transport gas to the reactor. Therefore, Applicants respectfully submit that Cherish does not disclose or suggest a feed vaporization and introduction system such as that claimed by Applicants.

Furthermore, the Office Action, at page 8, indicates that Applicants' "use of the term 'oxygenate' adds no further structure to the 'inlet' or the 'feed introduction nozzle' of the apparatus, because the oxygenate is not considered part of the apparatus." However, Applicants respectfully submit that an oxygenate inlet/nozzle at least indicates apparatus materials requirements, which are closely related to structural apparatus requirements. Indeed, Applicants respectfully submit that an inlet/nozzle contacting relatively reactive oxygenates (for forming olefins) have unique materials requirements, because Applicants' claimed oxygenate inlets/nozzles readily undergo undesirable side reactions with certain metals found in other standard inlets/nozzles for systems not exposed to relatively reactive oxygenates. Applicants respectfully submit that Cherish's inlets/nozzles, which are taught to be exposed to "[c]har fines and coals" at temperatures in the neighborhood of 500°F or less, do not have the same materials requirements, and thus are different in construction, or structurally different, from Applicants' claimed oxygenate inlets/nozzles. Alternately, for this reason, Applicants respectfully submit

that Cherish does not disclose or suggest a feed vaporization and introduction system such as that claimed by Applicants.

Claim 104 was rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 3,874,562 to Bushmann (hereinafter "Bushmann"). This rejection is now moot, due to the cancellation of the claim by this amendment.

Claim Rejections – 35 U.S.C. § 103(a)

Claims 95, 102, 103 and 105-108 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Cherish in view of Roberge (*Handbook of Corrosion Engineering*). This rejection is no longer relevant to claims 105-108, as those claims have been canceled by this amendment. The rejection is traversed, however, with regard to claims 95, 102 and 103, and reconsideration is requested.

Roberge has been cited for a generalized teaching that various alloys are known. Roberge does not address the particular problem of how to reduce or eliminate the formation of metal catalyzed side reactions that occur when heated methanol comes into contact with metal surfaces. In particular, Roberge discusses only general corrosion problems, but does not provide any teaching that would motivate one to use the particularly claimed metal compositions in a MTO feed vaporization and introduction system, and particularly in the specific type of feed vaporization and introduction system as that claimed by Applicants. If the Examiner is using Roberge merely as an alternative to taking Official Notice of the presence of the alloys specifically claimed, then Applicants respectfully submit that the Examiner has still not provided motivation of one of ordinary skill in the art to combine Roberge with Cherish or to modify Cherish with the information disclosed in Roberge. Accordingly, the combination of Cherish and Roberge fails to suggest Applicants' claimed invention.

Claims 105 and 106 were rejected under 35 U.S.C. § 103(a) as being obvious over Bushmann. Because those claims have been canceled by this amendment, this rejection is rendered moot.

Claims 105-108 were rejected under 35 U.S.C. § 103(a) as being obvious over Bushmann in view of Roberge. This rejection is also moot, as those claims have been canceled.

CONCLUSION

Having demonstrated that the cited references fail to disclose or suggest the invention as claimed, this application is in condition for allowance. Accordingly, Applicants request early and favorable reconsideration in the form of a Notice of Allowance.

If there are any questions regarding this amendment or the application in general, a telephone call to the undersigned would be appreciated, since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response. Please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1712 (Docket #: 2002B124/2).

Respectfully submitted,

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